

**Indiana State Department of Health  
Injury Prevention Program  
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**Data Report on Spinal Cord Injury**

**DATA HIGHLIGHTS**

- The leading cause of spinal cord injury (SCI) varies by age. Motor vehicle crashes are the leading cause among persons under age 65, while SCI in persons age 65 years and older occur due mostly to falls. The estimated cost per year for SCIs in the United States is \$9.7 billion.<sup>(1)</sup>
- Spinal cord injuries affect nearly 11,000 Americans each year.<sup>(1)</sup>
- Approximately 200,000 people in the U.S. live with a disability related to a SCI.<sup>(1)</sup>

**Indiana Data for 2003-2005**

**Mortality Data**

- There were 88 SCI deaths in Indiana. More males (57) died than females (31), with males dying at a rate two times greater than females. The number of deaths among whites (81) was higher than in blacks (6). Whites had a death rate of 0.5 per 100,000 and the death rate for blacks was unstable due to the low number of deaths.
- Indiana residents over 65 years of age had a death rate of 1.7 per 100,000. All other rates by age group were unstable.
- When comparing sex and age, the only age category with a stable death rate was males 65 years of age and older (2.3 per 100,000). When comparing race and age groups, whites over 65 years of age were again the only category with a stable death rate (1.6 per 100,000).

**Indiana Emergency Department Data**

- Of the 1,662,783 outpatient/emergency department (ED) visits with a primary diagnosis for injury or poisoning, 554 were visits related to SCI, which represented 0.0003% of all outpatient/ED visits. Of those receiving treatment at the outpatient/ED, 55% (305) were male, and 45% (249) were female. The age-adjusted rates for visits to the outpatient/ED were similar for whites and blacks.
- The age group with the highest age-adjusted rate of outpatient/ED visits due to SCIs was the 85+ year olds with a rate of 5.4 per 100,000, followed by individuals 20 to 24 years of age with 4.0 per 100,000.

- The total charges for SCI that were treated in an outpatient/ED were \$1.6 million. The majority of the patients had commercial insurance (39%) or Medicare/Medicaid (31%).

### **Indiana Hospital Inpatient Data**

- There were 161,198 inpatient hospitalizations with a primary diagnosis of injury or poisoning. Of these, 976 were for SCI, which represents 0.6% of all hospital admissions for patients who had a primary diagnosis of injury or poisoning.
- Of those admitted to the hospital for SCI, 70% were male and 30% were female. When comparing rates, males were 2.5 times more likely to be admitted to the hospital following a SCI than females. The age-adjusted rate for hospital admissions was higher in blacks compared to whites (7.16 per 100,000 versus 4.31 per 100,000).
- The age group with the highest age-specific rate of hospital admissions due to SCIs was the 85+ year olds. The lowest age-specific rate of hospital admissions due to SCIs was the 5-9 year old population.
- For 2003-2005, the total charges due to SCI patients who were admitted to the hospital were \$70 million. The majority of the patients had commercial insurance (33%) or Medicaid/Medicare (29%). The average length of stay for a SCI patient was 13.96 days (Range 1- 152 days) and the median length of stay was nine days.

## Spinal Cord Injury 2003-2005

### Introduction

Spinal cord injuries (SCI) affect nearly 11,000 Americans each year according to the CDC. The leading cause of SCI varies by age. Motor vehicle crashes are the leading cause among persons under age 65, while SCIs in persons age 65 years and older occur due mostly to falls. The CDC estimates that approximately 200,000 people in the U.S. live with a disability related to a SCI. Secondary conditions are a major health issue for people living with SCI. The most common secondary conditions are pressure sores, respiratory complications, urinary tract infections, spasticity, and scoliosis. The estimated cost per year for SCIs is \$9.7 billion.<sup>(1)</sup>

Groups at risk for SCIs are similar to TBI risk groups. Males are more likely than females to sustain a SCI. Blacks are at higher risk than whites for SCI. The age group at highest risk is 15-29 year olds and over half of the people who sustain a SCI are within this age group.<sup>(1)</sup>

### Mortality

Between 2003 and 2005, there were 88 SCI deaths in Indiana. More males (57) died than females (31), with males dying two times as much as females (0.6 per 100,000 compared to 0.3 per 100,000). More whites died than blacks (81 compared to 6). Whites had a death rate of 0.5 per 100,000 and the death rate for blacks was unstable due to low number of deaths. Indiana residents over 65 years of age had a death rate of 1.7 per 100,000. All other rates by age group were unstable. Table 1 shows the number of deaths by age. When comparing sex and age, the only age category with a stable death rate was males 65 years of age and older (2.3 per 100,000). Table 2 shows the number of deaths by sex and age. When looking at race and age groups, whites over 65 years of age were the only category with a stable rate (1.6 per 100,000) particularly males (2.4 per 100,000). Table 3 shows the deaths by race and age, and Tables 4 shows deaths by sex, race, and age.<sup>(2)</sup>

**Table 1: Spinal Cord Injury Deaths by Age, Indiana, 2003-2005**

	Number
Under Age 1	0
Age 1-4	1
Age 5-14	0
Age 15-24	6
Age 25-34	7
Age 35-44	9
Age 45-54	13
Age 55-64	13
Age 65+	39
Unknown	0
Total	88

Source: Indiana State Department of Health, Mortality Data, 2003-2005

**Table 2: Spinal Cord Injury Deaths by Sex and Age, Indiana, 2003-2005**

	Male	Female
Under Age 1	0	0
Age 1-4	1	0
Age 5-14	0	0
Age 15-24	6	0
Age 25-34	4	3
Age 35-44	6	3
Age 45-54	7	6
Age 55-64	11	2
Age 65+	22	17
Total	57	31

Source: Indiana State Department of Health, Mortality Data, 2003-2005

**Table 3: Spinal Cord Injury Deaths by Race and Age, Indiana, 2003-2005**

	White	Black
Under Age 1	0	0
Age 1-4	1	0
Age 5-14	0	0
Age 15-24	4	2
Age 25-34	7	0
Age 35-44	9	0
Age 45-54	13	0
Age 55-64	12	0
Age 65+	35	4
Unknown	0	0
Total	81	6

Source: Indiana State Department of Health, Mortality Data, 2003-2005

**Table 4: Spinal Cord Injury Deaths by Sex, Race and Age, Indiana, 2003-2005**

	White Males	Black Males	Black Other	White Females	Black Females
Under Age 1	0	0	0	0	0
Age 1-4	1	0	0	0	0
Age 5-14	0	0	0	0	0
Age 15-24	4	2	0	0	0
Age 25-34	4	0	0	3	0
Age 35-44	6	0	0	3	0
Age 45-54	7	0	0	6	0
Age 55-64	10	0	1	2	0
Age 65+	21	1	0	14	3
Unknown	0	0	0	0	0
Total	53	3	1	28	3

Source: Indiana State Department of Health, Mortality Data, 2003-2005

## Morbidity

Hospital discharge data was queried using SAS, version 9.0 for SCI-related codes in any diagnosis field. Due to some patients having multiple SCI diagnosis, the data summarizes the first SCI code presented for each patient. SCI codes include: 806-806.7 and 952-952.9.

Hospital discharge data give an indication of the number of SCI injuries in Indiana although the data have limitations. The hospital data base does not contain a patient-specific unique identifier, meaning that it does not distinguish whether one person had five visits or whether five people visited once. Therefore, statistics only reflect visits and not specific numbers of people. Also race/ethnicity data is not very accurate because race/ethnicity is at the discretion of the person reporting the data and may not reflect how the individuals would define themselves.

A major limitation of the hospital discharge data is that Indiana law does not mandate e-coding of hospital records. **Only 55% of hospital records are e-coded.** Also, Indiana law only requires hospital discharge data submission by acute care hospitals. All acute care hospitals are submitting inpatient data. However, one of the three Level 1 Trauma center hospitals has not submitted outpatient/emergency department data yet. As a result, **the total number of SCI incidents for the outpatient/emergency department data is an underestimation of the actual number of traumatic brain injuries and should be used with caution.**

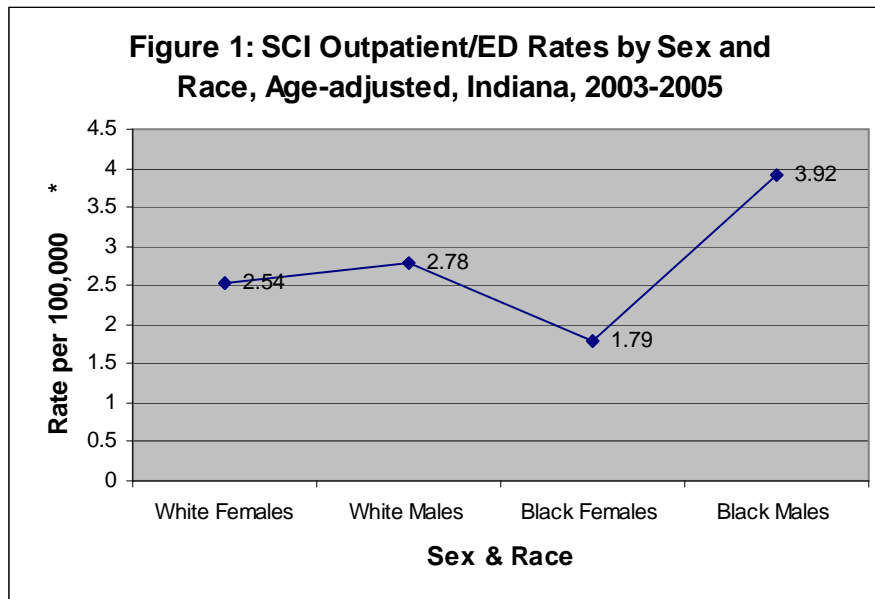
### *Emergency Department Data*

During 2003 - 2005, there were 1,662,783 outpatient/emergency department (ED) visits with a primary diagnosis for injury or poisoning (ICD-9-CM) codes 800-999. Of the 1,662,783 outpatient/ED visits, 554 were visits SCI-related and represented 0.0003% of all outpatient/ED visits.<sup>(3)</sup>

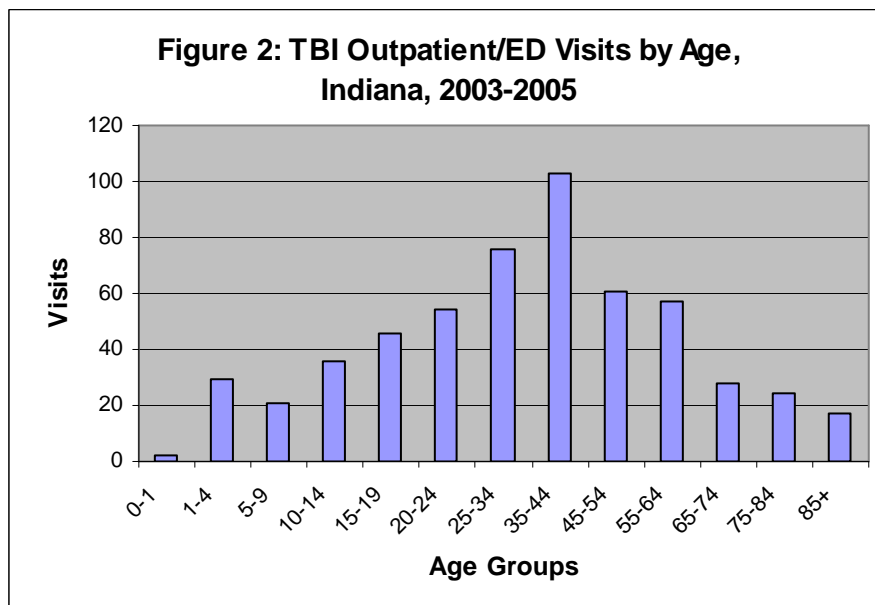
More males (55%, 305/554) than females (45%, 249/554) received treatment in the outpatient/ED. When comparing rates, males had a higher rate of outpatient/ED visits than females (3.34 per 100,000 compared to 2.61 per 100,000). The majority (79.6%, 441/554) of the admissions to the outpatient/ED were white Indiana residents. Blacks made up 7.8% (43/554) and those in the minority/other category were 12.6% (70/554) of visits. Blacks had a slightly higher age-adjusted rate for visits to the outpatient/ED than whites (2.81 per 100,000 versus 2.65 per 100,000). White females accounted for 38.4% (213/554) of all visits to the outpatient/ED, white males for 41.2% (228/554), black males for 5.2% (29/554), and 2.5% for black females (14/554). When comparing rates black males had the highest age-adjusted rate of 3.92 per 100,000 (Figure 1).<sup>(3)</sup>

During 2003-2005, the age group with the highest age-adjusted rate of visits to the outpatient/ED due to SCIs was Indiana residents over 85 years of age with a rate of 5.4 per 100,000 followed by individuals 20 to 24 years of age with 4.0 per 100,000. The lowest age-adjusted rate of visits to the outpatient/ED due to SCIs was children 0 to 4 years of age (0.78 per 100,000). Figure 2 shows the actual number of hospital outpatient/ED for each age group while Figure 3 shows the age-adjusted rate for each age group.<sup>(3)</sup>

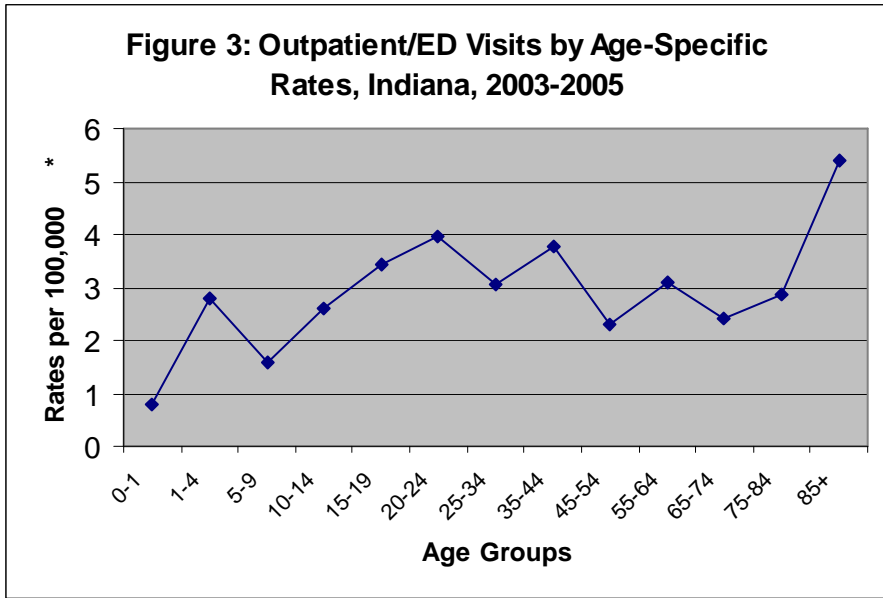
The median total charge for patients seen in the outpatient/ED for SCI injury was \$1,549.00 (Range \$74-\$68,511) as compared to the mean total charge for all ages of \$2,987.11 (Range \$0-\$68,511) (4). For 2003-2005, the total charges for SCI that were treated in an outpatient/ED setting were \$1.6 million. The majority of the patients had Commercial Insurance (39%, 218/554) or Medicare/Medicaid (31%, 172/554) (Figure 4).<sup>(3)</sup>



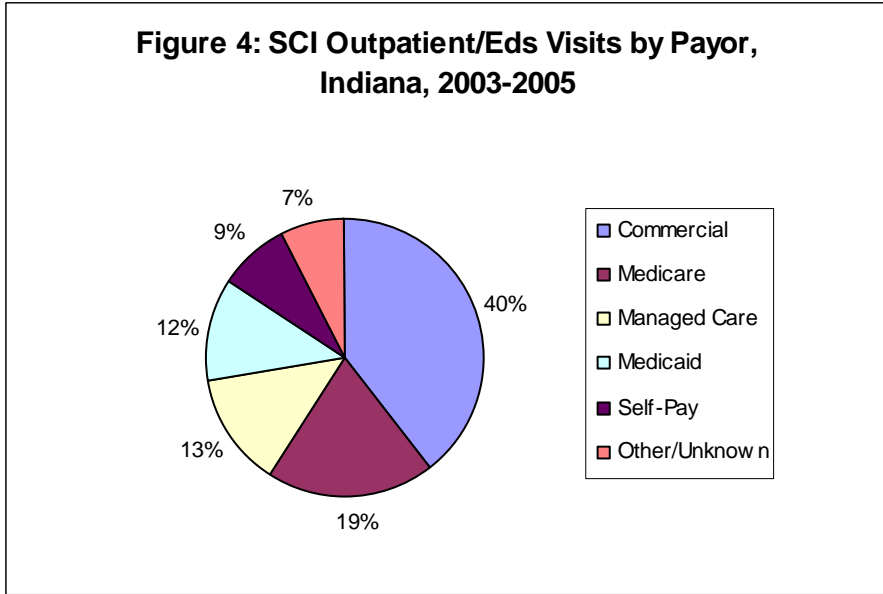
Source: Indiana State Department of Health, Hospital Discharge Data, 2003-2005



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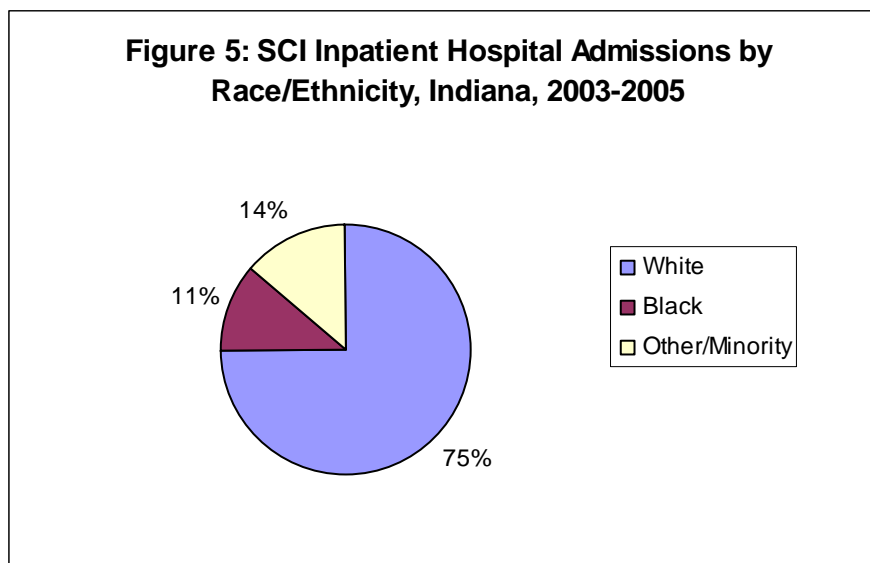
### *Inpatient Hospital Data*

From 2003-2005, there were 161,198 inpatient hospitalizations with a primary diagnosis of injury or poisoning. Of these, 976 were SCI, which represent 0.6% of all hospital admissions patients who had a primary diagnosis of injury or poisoning.<sup>(3)</sup>

Of those admitted to the hospital 70% (684) were male and 30% (292) were female. When comparing rates, males were 2.5 times more likely to be admitted to the hospital following a SCI than females. The majority (75%, 729/976) of the hospital admissions were white Indiana residents (Figure 5). However, the age-adjusted rate for hospital admissions was higher in blacks compared to whites (7.16 per 100,000 versus 4.31 per 100,000). White males accounted for 68% (499/729) of all hospital admissions by white Indiana residents (Figure 6). Black males had the highest age-adjusted rate (11.66 per 100,000) compared to all other sex/race categories. Black females had a higher adjusted rate of hospital admission compared to white females (3.11 per 100,000 and 2.60 per 100,000).<sup>(3)</sup>

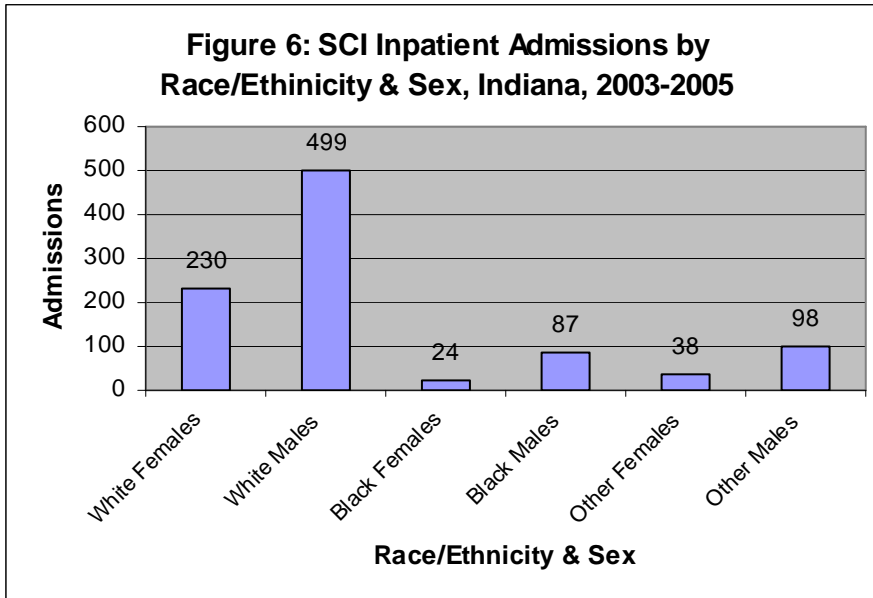
During 2003-2005, the age group with the highest age-specific rate of hospital admissions due to SCIs was those ages 85 years and older. The lowest age-specific rate of hospital admissions due to SCIs was the 5-9 year old population. Figure 7 shows the actual number of hospital admissions for each age group while Figure 8 shows the age-adjusted rate for each age group.<sup>(3)</sup>

The median total charge for patients admitted to the hospital for SCI was \$16,096.00 (Range \$49-\$617,969) as compared to the mean total charge for all ages of \$33,879.83 (Range \$49-\$617,969). For 2003-2005, the total charges due to SCI patients who were admitted to the hospital were \$70 million. About 33% (321/976) of the patients had commercial insurance and 28.9% had Medicare/Medicaid (282/976) (Figure 9). The average length of stay for a SCI patient was 13.96 days (Range 1-152 days) and the median length of stay was nine days.<sup>(3)</sup>

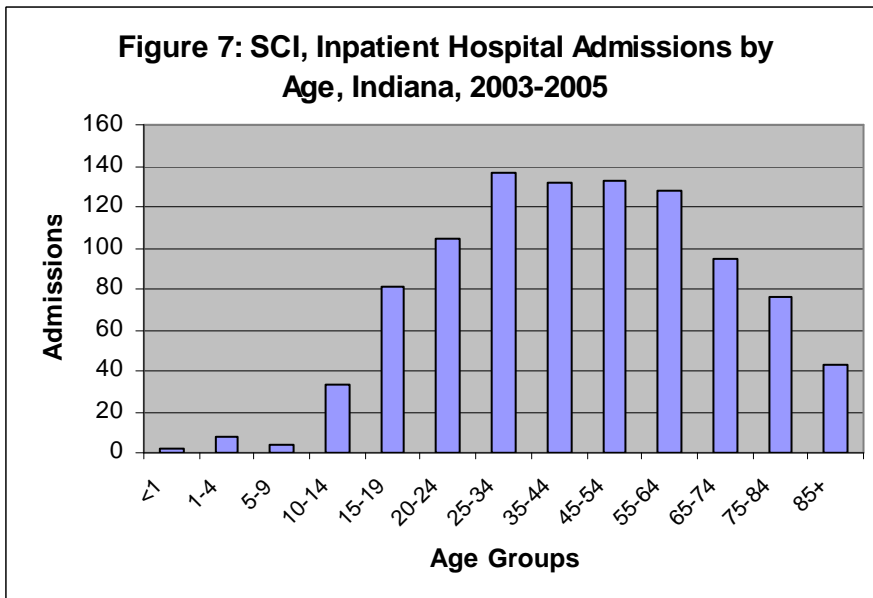


Source: Indiana State Department of Health, Hospital Discharge Data, 2003-2005

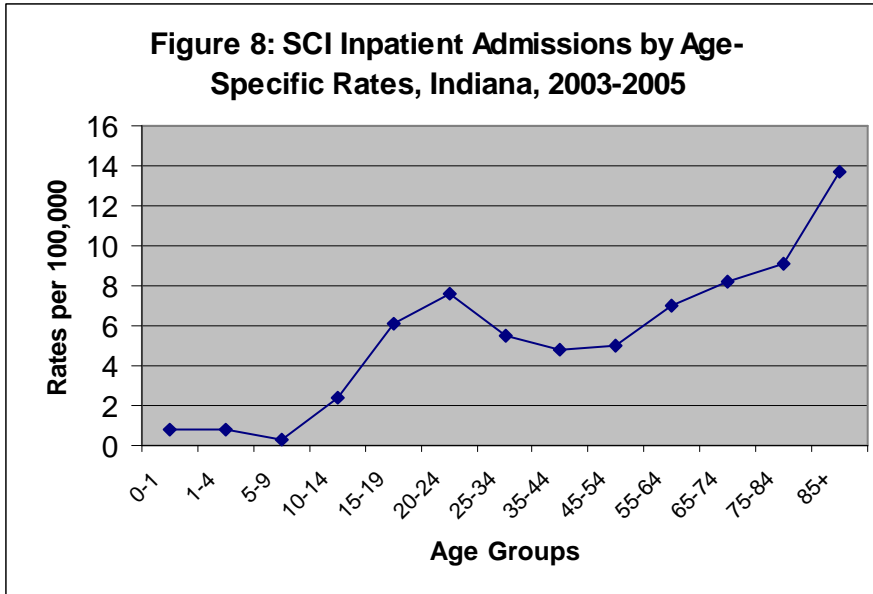




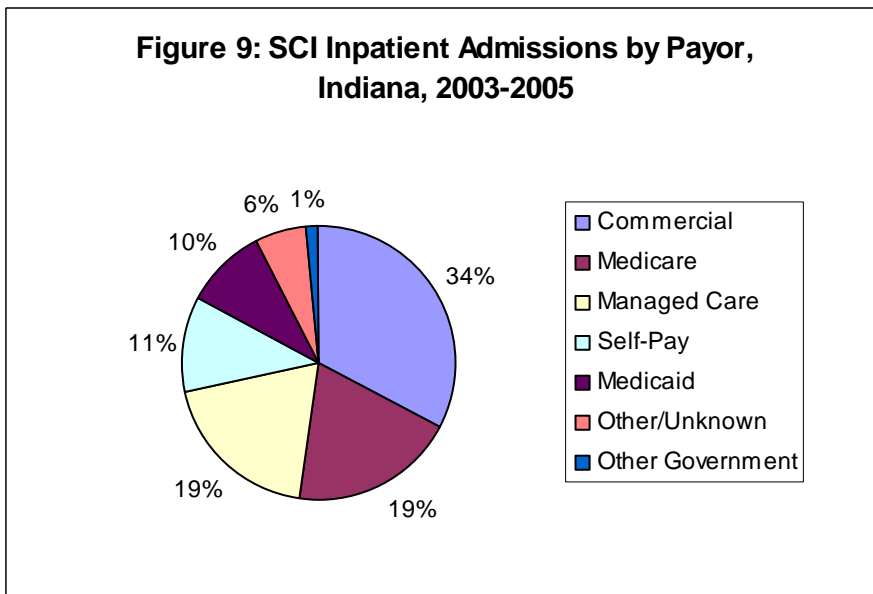
Source: Indiana State Department of Health, Hospital Discharge Data, 2003-2005



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## **References**

1. Berkowitz M, O'Leary P, Kruse D, Harvey C. Spinal cord injury: An analysis of medical and social costs. New York: Demos Medical Publishing Inc., 1998.
2. Indiana State Department of Health, Mortality Data, 2003-2005.
3. Indiana State Department of Health, Injury Prevention Program, Hospital Discharge Data, 2003-2005.